

Technological Innovation and Firm Performance among Star Rated Hotels in Ghana

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Abstract:

Background: The need to be more competitive in the hospitality industry is rising daily in Ghana and therefore places the demand on hotels to be more creative in their strategic moves to meet the growing taste and preference of clients. Technological innovation is seen as one of the essential elements to be considered by hotels in order to stay competitive. This paper examined the effect of technological innovation on profitability and customer satisfaction performance of star rated hotels in Ghana.

Methodology: The study used a quantitative approach and a descriptive research design. Data were collected using self-administered questionnaires to 450 managers of hotels in Ghana and a response rate of 96% (432) was generated. Descriptive statistics was used for the demographics, and factor analysis and regression were used to examine the relationship between technological innovation and performance.

Results: The study found that there was positive significant relationship between product/service and process innovation and profitability performance of the hotels. Also, the study discovered that product/service and process innovation had a positive significant relationship with customer satisfaction performance of the hotels.

Conclusion: The study recommends that hotels that seek to enhance their performance must invest some of their resources into product/service and process innovations.

Key Words: Technological innovation; Hospitality industry; Firm performance; Hotel Star rating

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I. Introduction

The new wave of globalization and growth surrounding the hospitality industry in the 21st century places a demand on the various units in this industry to more caution and concern on how services are provided. The hospitality industry is made of hotels, restaurants, (Dzhandzhugazova, et al., 2016) tourist sites, entertainment among others. All these units under the hospitality industry provide services of unique qualities that must best meet the needs of clients or customers (Evangelista, et al., 2013). This is important to maintain and improve on the performance of the unit in question (Tseng, et al., 2015).

The unit of concern under this study is the hotels. (Bettencourt, et al., 2013) posited that hotels are established to promote development, provide customized services to customers. This motive therefore places a need on the various hotels to be creative and innovative in order to survive and as well enhance their internal and external performances. Innovation has been described and defined by many scholars. Innovation is seen as a new product/ service or process introduced to the market to make profit (Schumpeter, 1934). Also, (Yu, et al., 2013) posited that innovation can be described to "something that is new or improvement done by an enterprise to create significantly added value either directly for the enterprise or directly for its customer." To achieve this, there is a need to employ certain competencies and capabilities which are variant to the conventional form of service delivery among the hotels (Al-Refaie, 2015).

In doing this, some hotels have launched new facility services while others have paid attention to how best service can be delivered to customers (Zaitseva, 2013). Furthermore, some of the hotels focus on improving process and product innovativeness through the use of modern technologies (Danso, et al., 2018). All these practices are vital necessities for a hotel to stay on top of its game in the market place. The current world of business among hotels has necessitated for a more comfortable, clean, luxurious and cost-effective facilities that serve diverse customers according to their class and status (Geetha, et al., 2017). Hotels in Ghana are star rated. When hotels highlight their rooms' online, part of their advertisement comprises star ratings as a higher number of stars suggests that a hotel has top-notch amenities despite this premium comes with an increase in rates. However, guests who stay in two hotels who have the same star rating are likely to receive similar amenities and services. Similar does not necessarily mean the same quality but rather refers to the same level of features ((Martin-Fuentes, et al., 2018, Zervas, et al., 2017)).

For example, a newly established upscale hotel in Accra with a bathtub and walk-in closet gets the same rating as a hotel in Takoradi that has been operating for over twenty years. While the standard rating ranges from one to five stars, cities such as Dubai present hotels with six and seven-star ratings. Several rating bodies and entities have made attempts to standardize the ratings by evaluating hotels every five years to raise or reduce their star ratings. To attain a particular rating; updated facilities, exceptional service, a comfortable and friendly ambience are fundamental requirements for evaluation (Amankwah - Amoah, et al., 2018).

Hotels can measure their service performance in terms of how well they are satisfying their clients as well as the improvement in their profit margins over the period (Ali and Omar, 2014). The current wave in the hotel industry create room for services with higher levels of innovativeness contributing more to higher customer satisfaction and financial performance for organizations (Tseng, et al., 2015). In this note, the service and process innovation of hotels in Ghana is not far behind (Parnian, et al., 2013) and with more deliberate and intentional steps in enhancing service performance of hotel services, it may be likely to satisfy the differing requirements of its customers.

According to the Ghana Tourism Authority (GTA), international tourist arrivals rose from 580,000 in 2007 to 980,141 in 2017, though driven primarily by the growth of business tourism. Proceeds from international tourism also increased from US\$879 million in 2007 to US\$1,800 million in 2017, on the average tourist spending amount to US\$1,892 per visit in 2017. Tourism, especially high-end leisure and ecotourism, is already having a positive impact on jobs and community income around, and has demonstrated economic benefits for Ghana's coastal areas, such as Cape coast, Elmina and Takoradi. The World Travel and Tourism Council (WTTC) reports that tourism directly contributed percent (US\$1,000.3 million) of Ghana's GDP in 2016 and directly employs 287,900 people (or 24 percent of total employment) also employs indirectly two to three times this much. However, despite the increasing research on product innovation and service innovation, majority of the past works focus on issues of innovation in the manufacturing firms ((Baffour, et al., 2018); (Afful and Owusu, 2017); (Gotah, 2017); (Zanello, et al., 2016); (Tetteh and Essegbey, 2014) whereas a slight concern has been given to the service industry.

Furthermore, there is little literature on how product/service and process innovation influence the profitability and customer satisfaction performance of hotels in Ghana ((Baffour, et al., 2018); (Afful and Owusu, 2017); (Gotah, 2017); (Yeboah, 2015). Although these studies have addressed different issues in different contexts, no relevant studies have been found in the Ghanaian context addressing the assessment of product/service and process innovation on the profitability and customer satisfaction performance in hotels in Ghana. Also most of these studies used basic descriptive statistics as their analytical tool but this study used inferential statistics to provide a more comprehensive picture for analysis. Specifically, the study examined the effect of product/service and process innovation on the performance of star rated hotels in Ghana.

II. Literature Review

The Resource Based View (RBV) theory was employed to explain the relationship between technological innovation and performance among the star rated hotels in Ghana. The Resource Based-View (RBV) theory was led by Birger Wernerfelt, who used the theory as a basis for his article published in 1959 about the motive for the differentiation of companies in the market. The main argument of this theory is that the heterogeneity of the market position among competitors is derived solely from the resources and capacities of an organization. RBV basically considers that the differences in the profitability of companies are consequences of the different sources of income, which derive from the control and management of strategic resources; and this management involves some circumstances that can lead the company to maintain high levels of return (profitability) for a long period of time. The resource-based view of a firm poses an important question regarding the manner in which firms associate resources with competitive edge by means of superior value creation, so as to offer them the prospect of improving performance ((Barney, 1991); (Conner, 1991); (Newbert, 2008); (Wernerfelt, 1984)). In relation to this study, it can be asserted that when hotels advance in terms of new innovations in their service and process delivery, there is the tendency for improved performance.

2.1 Product/service innovation

Product innovation is described as the creation of a new product from new materials (totally new product) or the alteration of existing products to meet customer satisfaction (improved version of existing products) (Martin-Fuentes, et al., 2018). It also deals with the introduction of new products or services in order to create new markets or customers or satisfy existing markets or customers (Afful and Owusu, 2017). Service innovation can be said to be a radically or incrementally improved service concept, service delivery system, client interaction channel, or technological concept that independently but most likely in combination, leads to increased value creation for either or both the internal and external customer: and requires the application of specialised competencies (Papadaki, 2016). The innovation of hotel products is receiving greater emphasis, as all hotel related products are being renewed. The cause is the increased needs for satisfaction. Lee, et al. (2020),

contend that service innovation can be made by exploiting new ideas. Service innovation among hotels provides a variety of choice for products (Njoroge, et al., 2019). It is important to choose the right fragrance for a respectable hotel intending to emphasize the atmosphere of luxury and refinement, because the aroma itself is the sensation (Agarwal, 2019). Experts in hospitality industry understand that people do not come to a five-star hotel because they have nowhere else to stay. They come there to immerse themselves in an atmosphere of well-being and peace of mind (Sharma and Thusoo, 2017).

Consumers are no longer satisfied with a comfortable and well-furnished room, they need to be very impressed, convinced and even won over (Bilgihan and Nejad, 2015). These methods include interesting architecture of hotel buildings, modern landscape design, attractive interiors and a variety of technological innovations ranging from the common WI-FI to the integrated innovative smart house technology (Dzhandzhugazova, et al., 2016). Service innovation is one of the sources for enhancing performance among hotels (Agarwal, 2019). It deals with the creation of intangible assets, which translates to provide the consumer with benefits worth paying for. In this respect, the intangible assets may include a good mood, spiritual or cultural development or the provision of a unique experience (Dzhandzhugazova, et al., 2016). With service innovation, service quality of hotels could be enhanced, which in turn contributes to performance (Afful and Owusu, 2017).

2.2 Process innovation

In general, process innovation is the process of reengineering and improving internal operation of business process (Magri, 2019). This is very important for the hotel industry's profitability. The process innovation is shown primarily in the improving of the communication and computer networks. This kind of change is the strongest modifying and reshaping force in the market, so hotel CEOs know how important this innovation is, especially how important the innovation in the communication and how essential information technology's potential benefits can be, which are deeply influenced by the relationship between the customer and the service. However, hotel guests are people who still want a warm friendly welcome, care and attention but now those desires are satisfied with the help of innovative solutions creating almost any atmosphere and affecting an array of human feelings and emotions. Process innovation encompasses changes or implementation of new procedures, which affects the routine works, activities, and processes and can enable an organization to achieve improvement in speed, quality and cost, meet the customer demands and adapt to the changing environment (Wu, 2013)

2.3 Hypothesis development and research framework

2.3.1 Product Innovation and Hotel Performance

According to Martin-Rios and Ciobanu (2019), product innovation offers a potential protection to a firm from market threats and competitors. Nwangene, et al. (2019), proved that product innovation had positive and significant link with organizational performance. Sari, et al. (2019), confirmed a positive impact of innovation on performance. Similarly, karim Suhag, et al. (2017), found that both product innovation dimensions (efficacy and efficiency) were strongly and positively related to firm performance. The introduction of novel product is positively associated with firm performance was also confirmed by (Flammer, 2015). Zwingina, et al. (2017), examined the impact of innovation on the performance of small and medium scale enterprise using Ordinary least Square method of multiple regression. The study found that there is significant relationship between product innovation and performance of SMEs.

Abdilaahi, et al. (2017), further examined the impact that innovation has on firm small and medium enterprises performance in Hargeisa, Somaliland. The result demonstrated there are positive effects of product innovations on firm performance. A similar finding was seen in the study of Karabulut (2015), on the effect of innovation types on performance of manufacturing firms in Turkey. Their study found that product innovation has positive impact on financial performance, customer performance, internal business processes performance and learning and growth performance. On the other hand, a contrary finding was seen in Prifti and Alimehmeti (2017) that the relationship between product innovation and organisational performance was positive but not significant.

2.3.2 Process Innovation and Hotel Performance

To Zhou, et al. (2019), process innovation concerns with the creation of or improvement in techniques and the development in process or system. For instance, innovation in technology, skill, techniques, system and procedure, which is used in the process of service delivery among hotels. Product innovation is mostly induced by demand factor, but supply side could be a significant driver for this type of innovation as well (Susanto and Wasito, 2017). Upgraded technologies, changing customer tastes, and shortening product life cycles, combined with overall increased global and regional competition, force firms to innovate relentlessly (Osei, et al., 2016). More specifically, such an innovation is positively associated with firm growth (Karabulut, 2015).

Using regression model, Olughor (2015), investigated how innovation affects business performance in small and medium-sized enterprises (SMEs) in an up-and-coming market. The study demonstrated that there is a high correlation between process innovation and firm's financial performances. This finding is also supported in Nwosu, et al. (2015), evaluation of the effect of technological innovations on corporate performance that process innovation significantly affects firm's performance positively.

Consistent with this argument, Prifti and Alimehmeti (2017), study on SMEs in Finland found that process innovation is positively related with firm performance. Using new technology as a proxy for process innovation, Tuan, et al. (2016), found a significant relationship between new technology and firm performance. Recent evidence by Lee, et al. (2020), reconfirmed the positive and significant influence of product and process innovation on firm performance.

From the above, it can be said that;

H1. There is a positive significant relationship between product/service and process innovations and hotel profitability performance.

H2. There is a positive significant relationship between product/service and process innovations and hotel customer satisfaction performance.

2.3.3 *Research framework*

The research framework shows the components of technological innovation drawn from literature review on innovation theories and empirical literature. The research framework also draws from existing studies and knowledge on innovation and performance both on the local and international domains. This would be used to analyse the effect of the independent variable on the dependent variable which are technological innovation (product/service innovation and process innovation) and hotel performance (profitability and customer satisfaction) respectively.



Fig, 2.1 Research Framework Diagram of Technological Innovation and Hotel Performance.

III. Research Methodology

3.1 *Research design*

The study employed the descriptive research design. The descriptive research design collects information through data reviews, surveys, interviews or observation (Gay, 1987). Furthermore, descriptive research design seeks to describe, explain and interpret conditions or trends. Ultimately, descriptive design deals with practices, conditions, structures, differences, relationships that exist, opinions held, and processes and trends that exist. This study employed this design because information was collected from managers of star rated hotels and present a descriptive interpretation of data.

3.2 *Research approach*

Based on the study objectives, the quantitative research approach was considered. A research approach is a plan or procedure for a study which spans the steps from broad assumptions to detailed methods of data collection, analysis and discussions (Creswell and Creswell, 2017). The quantitative approach enables the use of quantitative tools such as descriptive and inferential in describing key issues in the study (Hoover and Donovan, 2008). The study therefore employed the quantitative approach because it sought to examine a relationship based on numerical values and thus requires quantitative tools such as regression.

3.3 *Population and Sample Size*

The population of a study includes a group of people who meet the specified criterion for the study investigation (Alvi, 2016). Basically, the population consists the respondents of the study. The population of this study was the managers at star rated hotels in Ghana. There are over six hundred (600) star rated hotels in Ghana, hence a sample size of 432 was used (Kotrlík and Higgins, 2001).

3.4 *Data Type and Sources*

Data type for the study was quantitative and the source of data was primary. The quantitative data was generated through the coding of the responses that were generated from the data survey.

3.4.1 *Measurement of Variables*

Technological innovation was measured using product and process innovation ((Karabulut, 2015); (Oecd, 2005)). There were five questions under both product and process innovation. On the other hand, hotel performance was measured using two components from the balance scorecard approach. The variables for hotel performance were profitability and customer satisfaction performance. Each of these variables has five questions.

3.4.2 *Data collection instrument*

There are various instruments for data collection in study. This study made use of a closed ended structured questionnaire. The questionnaire was in three sections. The first section (A) looked at the demographics of respondents; second section (B) captured the component of technological innovation; and section C) presented of the components of performance.

3.4.3 *Validity and Reliability*

Validity which determines how items in the collection instrument represent the phenomenon being measured was ensured by carefully scrutinising the research instrument in order to identify possible conflicting, ambiguous and grammatical errors with some questionnaire items. Moreover, Reliability is tested to find out the extent to which measurement of a particular test is repeatable. A Cronbach Alpha of .7 and above was considered to ensure reliability in the variables.

3.4.4 *Data analysis*

Data could be analysed using simple descriptive statistics or inferential statistics. Descriptive statistics as frequencies, percentages and so on. Inferential statistics such as factor analysis (principal component analysis) and regression. The descriptive statistics were used for the demographics and the factor analysis and regression was used for the objectives of the study.

3.5 *Statistical software*

The software that was employed for data processing include the Statistical Package for Social Sciences (Version 25.0) for generating the descriptive statistics, reliability of the measurement, factor analysis and regression.

3.6 *Ethical consideration*

According to Patten and Newhart (2017), the major ethical issues that need to be considered in every research comprise voluntary participation, right to privacy, anonymity and confidentiality of information. As such, all efforts were geared towards ensuring that all these ethical issues are attended to.

IV. Results And Discussion

4.1.1 *Demographics of Respondents*

Table 1: Demographics of the Respondents

Demography	Characteristics	Frequency	Percentage (%)
Age of Firm	10 years and below	333	67.8%
	11-20 years	97	19.8%
	21 years and above	2	.4%
	Total	432	100%
Education of Managers	Diploma/College Cert.	70	14.3%
	First Degree	250	50.9%
	Master's Degree	57	11.6%
	Executive Masters	55	11.2%
	Total	432	100%

Source: Field Data, Danso, 2020

From Table 1, the results indicate that three hundred and thirty three (333) of the hotels representing about (67.8%) were within the age bracket of 10 years and below; ninety seven (97) of the hotels representing about (19.8%) were within the age bracket of 11-20 years; and two (2) of the hotels representing (.4%) were within the age bracket of 21 years and above. Thus, this implies that the hotel industry in Ghana is a growing one.

4.2 *Product/Service and Process Innovation among Star Rated Hotels in Ghana*

The various dimensions of the product/service and process innovation were investigated using principal component analysis (PCA). This was necessary in providing understanding of how the managers construe the innovation factors. Prior to executing the PCA, it was important to investigate the suitability of the dataset for this analysis. This was done using Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy. The result of

KMO test as shown in Table 2 supported the use of principal component analysis due to the adequacy at 0.862 which is greater than the acceptable value of 0.7 recommended by (Pallant, 2011).

Table 2. KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.862
Bartlett's Test of Sphericity	Approx. Chi-Square	2809.811
	df	45
	Sig.	.000

Source: Field Data, Danso, 2020

Furthermore, Table 2 revealed that the Bartlett's test of sphericity ($\chi^2 = 2809.811$; $df = 45$) showed that the p value was significant at 0.000, meaning that the population was not an identity correlation matrix. These two tests supported the use of principal component analysis in investigating the dimensions of the innovation factors in the study area (Pallant, 2011).

Table 3: Factor Analysis Results of Independent Variables

	Factor Loadings	% Variance Explained	Cronbach Alpha
Product Innovation			
Computerized management and surveillance systems	.855	53.925	.828
Nano technology textile products in guest rooms	.842		
New tourism products like health tourism and agri-tourism	.840		
Wireless internet access	.820		
Loyalty programs	.787		
Luxury rooms	.771		
Free tea and coffee kits in guest rooms	.763		
Process Innovation			
Intra-units computer system network	.892	13.447	.75
Processes on communication with guests prior to visit and payment	.854		
IT based reservation system	.461		

Source: Field Data, Danso, 2020

In Table 3, the rule of thumb was that only factor loadings with values not less than 0.4 were retained. The total variance explained by the independent variables was 67.372%, which is good for validation. The Cronbach Alphas of the independent variables passed the benchmark of 0.7 (Cohen, et al., 2013).

4.3 Performance of Star Rated Hotels in Ghana

The various dimensions of the hotel performance were investigated using principal component analysis (PCA). This was necessary in providing understanding of how the managers construe the performance indicators. Prior to executing the PCA, it was important to investigate the suitability of the dataset for this analysis. This was done using Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy. The result of KMO test as shown in Table 4 supported the use of principal component analysis due to the adequacy at 0.719 which is greater than the acceptable value of 0.7 recommended by (Pallant, 2011).

Table 4: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.719
Bartlett's Test of Sphericity	Approx. Chi-Square	2649.656
	df	45
	Sig.	.000

Source: Field Data, Danso, 2020

Furthermore, Table 4 revealed that the Bartlett's test of sphericity ($\chi^2 = 2649.656$; $df = 45$) showed that the p value was significant at 0.000, meaning that the population was not an identity correlation matrix. These two tests supported the use of principal component analysis in investigating the dimensions of the performance indicators in the study area (Pallant, 2011).

Table 5: Factor Analysis on Dependent Variables

	Factor Loadings	% Variance Explained	Cronbach Alpha
Profitability Performance			
Our return on equity has been improving	.847	41.884	.807

We have experienced increasing economic value added	.787		
Firm's net income/revenue is increasing steadily	.779		
Return on investment helps maintain our investors	.744		
We have experienced increasing earnings before tax	.563		
Customer Satisfaction Performance		23.731	.889
We receive less number of complaints	.909		
Our products have high repurchase rate	.874		
We have high new customer retention	.839		
Our customers are satisfied with our mix of products/services	.815		
There are a number of new products/services launched	.626		

In Table 5, the rule of thumb was that only factor loadings with values not less than 0.4 were retained. The total variance explained by the independent variables was 65.615%, which is good for validation. The Cronbach Alphas of the dependent variables passed the benchmark of 0.7 (Cohen, et al., 2013).

4.4 Technological Innovation and Hotel Performance in Ghana

4.4.1 Effect of Product/Service and Process Innovation on Hotel Profitability Performance

Table 6: Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.716 ^a	.512	.500	.40475

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.946	5	7.189	43.884	.000 ^b
	Residual	34.238	209	.164		
	Total	70.184	214			

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.740	.165		4.471	.000
	PI	.286	.061	.288	4.675	.000
	PRI	.178	.049	.216	3.623	.000

a. Dependent Variable: Hotel Profitability Performance

b. Predictors: (Constant), Product Innovation (PI) and Process Innovation (PRI).

The R squared in Table 6 represents the coefficient of determination which is the proportion of variation in the dependent variable explained by the regression model. Thus, about 51.2% of the variation in hotel profitability performance is explained by product/service and process innovation. In this analysis, the ρ -value is well below .000 ($\rho < .01$). This implies that, the R and R² between the components of technological innovation and hotel profitability performance is statistically significant, and therefore product/service and process innovation can significantly influence hotel profitability performance. This finding is supported by (Olughor, 2015) and (Abdilahi, et al., 2017) that product and process innovation significantly influence firm financial performance.

4.4.2 Effect of Product/Service and Process Innovation on Hotel Customer Satisfaction Performance

Table 7: Regression Analysis

Model	R	R Square	Adj. R Square	Std. Error
1	0.876	0.732	0.701	0.847

Model		Sum of Sq.	df	Mean Square	F	Sig.
1	Regression	33.488	5	6.698	9.327	0.000
	Residual	130.502	182	0.718		
	Total	186.090	185			

Variable	Coefficient	Std. Errors	T-statistic	Sig.
Constant	1.350	0.549	2.458	0.016
PI	0.384	0.079	4.861	0.000
PRI	0.369	0.094	3.926	0.000

a. Dependent Variable: Hotel Customer Satisfaction Performance

b. Predictors: (Constant), Product/Service Innovation (PI) and Process Innovation (PRI).

The R squared in Table 7 represents the coefficient of determination which is the proportion of variation in the dependent variable explained by the regression model. Thus, about 73.2% of the variation in hotel customer satisfaction performance is explained by product/service and process innovation. In this analysis, the p -value is well below .000 ($p < .01$). This implies that, the R and R² between the components of technological innovation and hotel profitability performance is statistically significant, and therefore product/service and process innovation can significantly influence hotel customer satisfaction performance. This finding is supported by (Karabulut, 2015) that product and process innovation significantly predict firm customer performance.

V. Conclusion

5.1 Conclusion

Technological Innovation can determine the performance of star rated hotels in Ghana. This paper has revealed that profitability and customer satisfaction can be enhanced by paying due diligence to product/service and process innovation. Moreover, the objectives of the paper were extensively achieved. With the first objective, the study discovered that a positive significant relationship exists between product/service and process innovation and hotel profitability performance. And with the second objective, the study found a positive significant relationship between product/service and process innovation and hotel customer satisfaction performance. These findings were seen in coefficients of the various independent variables in the regression analysis. To be precise, technological innovation impacts on the performance of hotels in Ghana.

In summary, hotels in the Ghanaian hospitality industry that capitalize on product/service and process innovation have more chances of enhancing their profitability and customer satisfaction performance. Theoretically, the result of this paper provides empirical evidence for the impact of technological innovation on the profitability and customer satisfaction performance of hotels in the hospitality industry. The paper adds to literature by empirically establishing a more comprehensive list of the determinants of firm performance. The study has also extended the boundary of applicability of the term innovation. Thus it has established that technological innovation does not only work in the manufacturing sector but also in the services sector, in this case the hospitality industry.

In terms of managerial implications, management of hotels who seek to enhance their performance must push some resources into product/service and process innovations.

5.2 Suggestion for Further Study

This research was conducted in the hospitality industry (hotels) excluding Telecommunication, Banking, Insurance, Restaurant, Tourist Sites and Supermarkets. Therefore, other authors could equally replicate this study in these other institutions. Again, this study only focused on technological innovation and performance, future study could also consider non-technological innovation and performance.

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